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Application : 101764732 Examiner : William GAU : 2874

From: J. Blach Location: IDC FMF FDC Date: 5/4/05

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DOC CODE	DOC DATE	MISCELLANEOUS
<input type="checkbox"/> 1449		<input checked="" type="checkbox"/> Continuing Data
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<input type="checkbox"/> IIFW		<input type="checkbox"/> Fees
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<input type="checkbox"/> DRW		
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[RUSH] MESSAGE:

Application No 101239382 and PCT/GB01/01309 are
listed on palm as continuing data but not continued
in specification. Please make all necessary changes
to specification.

Thank you!

[XRUSH] RESPONSE:

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REV 10/04

METHOD AND APPARATUS FOR GENERATING A PULSE WIDTH MODULATED SIGNAL AND OPTICAL ATTENUATOR CONTROLLED BY A PULSE WIDTH MODULATED SIGNAL

See
The present invention concerns a method of, and apparatus for, generating pulse width modulation (PWM) signals. More especially the invention concerns controlling temperatures of electro-optical components such as attenuators, filters and solid state lasers. For use in optical communication. Moreover, although not exclusively, the invention concerns an optical attenuator with an enhanced resolution for use in an optical communication system.

- 10 It is conventional practice to employ optical attenuators in optical communication systems for regulating and controlling the power of optical radiation propagating within the systems. Such attenuation is necessary in order to avoid saturating sensitive optical components such as detectors and optical amplifiers, as well as ensuring that optical radiation is of sufficient power not to be swamped by noise. Saturation can lead to loss of information and hence
- 15 errors in communication traffic conveyed by the systems.

- Conventional optical attenuators employ a number of different optical component configurations, for example they can comprise one or more of Mach-Zehnder interferometers, modulated liquid crystal shutters and dispersion effect modulators. In
- 20 communication systems, it is particularly convenient to employ thermally variable optical attenuators whose optical attenuation is determined by attenuator temperature. Thus, attenuation can be selected in these thermally variable attenuators by adjusting their temperature.

- 25 Temperature adjustment is conveniently achieved by including thermoelectric elements into the variable attenuators. Such elements function by the Seebeck effect and can selectively cool or heat attenuation determining optical components incorporated within the attenuators. However, the elements often consume significant power in operation, for example 2.5 Watts corresponding to an electrical drive signal of 5 volts potential at 0.5 amps current.

- 30 Conventional optical communication systems are typically configured as a plurality of nodes interconnected by optical fibre waveguides through which communication traffic bearing

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This application is a division of serial number 10/239,382 filed
February 4, 2003 now patent number 6,747,778, which is a 371 of
PCT/GB01/01309 filed March 23, 2001